Periscope.

a.—ANATOMY OF THE NERVOUS SYSTEM.

MOVEMENTS OF THE BRAIN.—Luys, in a communication to the Academy of Medicine of Paris, March 25, 1884 (*L'Encéphale*, 1884, No. 4), brought forward a quite new idea, that the brain as a whole changes its position within the cranial cavity, according to different attitudes of the body. When we stand erect the brain is not in contact with the vault of the cranium, as we have been accustomed to believe. When we assume the horizontal position it slides very gently backward, leaving between its anterior surface and the frontal bone a corresponding free space. This space is obliterated when we assume an inverse position, lie with the face downward. In the lateral horizontal posture, the hemisphere placed above presses slightly on the other, and causes a sensible deviation of the falx cerebri, which serves as its bed. The free space is occupied by the cerebro-spinal fluid, which, obeying the laws of gravity, is displaced by the heavier brain substance in different positions of the body. In the vertical position of the cadaver this free space is about 5–6 mm. in depth, though doubtless less during life.[1]

These observations were first made accidentally in the cadaver. To prove their correctness, L. subsequently made more careful investigations on the cadaver, and added observations, which have been made, of changes in the prominence of the fontaneles in children, and of parts of the brain where portions of the skull have been lost in the adult, with changes in the position of the body.

Luys then attempts to bring this assumed fact of movement of the brain in relation with certain physiological and pathological manifestations: the momentary vertigo often produced in changing from a horizontal to a vertical position, sea-sickness, pain in movement in cases of meningitis, epileptic attacks at night, etc., etc.

[1] In a communication to the Academy, April 29th, Luys stated that the free space occupied in the normal state by cerebro-spinal fluid may be estimated at one eleventh of the cranial capacity.

In the discussion which followed this communication, Luys' statements were not allowed to pass unchallenged. There was a general dissent from the view that there was a considerable space occupied by fluid between the brain and the skull, and that the brain as a mass was movable within the cranial cavity. The dissent was based partly upon personal observations and experiments, partly on the belief that the data presented by L. were not sufficient to establish his views. But Collin mentioned that he had experimented on the skull of a living horse and observed some movement of the brain, but only in the occipital region, and to a much less extent than noted by Luys; and Sappey stated that, according to his observations, there is usually a space of about 5 mm. in depth, between superior surface of brain and the bone, which is occupied by cerebro-spinal fluid, but this fluid (and therefore the brain) does not alter its position with changed attitudes of the body.

THE NEUROGLIA.—According to Gierke (*Neurologisches Centralblatt*) the neuroglia is not to be classed with the connective tissues, but has a peculiar place of its own in histology. We have to distinguish in it the intercellular substance and the cellular elements, or the unformed and the formed elements. The intercellular substance is especially abundant in the gray matter of the central nervous system, where it makes up about one third of the entire mass; while in the white matter is found principally the formed elements of the neuroglia. The intercellular substance is homogeneous and transparent as glass, similar to coagulated blood serum. The oft-mentioned threads and granules are artificial products. The formed elements consist of cells and their prolongations. Nuclei are found, if at all, only in small numbers, and never in form of granular masses. The prolongations of the cells attain a length of 0.4 mm. There are two kinds of cells: the one is almost filled by the large oval nucleus, the other contains a very minute nucleus. In the white substance of the spinal cord the cells and their prolongations form sheaths around every nerve fibre, while the intercellular substance of the neuroglia is absent. Fibrillary connective tissue is not found in the white substance of the cord.—*Centralblatt fur klinische Medicin*, 1884, No. 3.

THE CEREBELLAR CORTEX.—Beevor (*Du Bois-Raymond Archiv.*) gives the following on the histological structure of the cerebellar cortex:

1. The layer of granules. Every Purkinje's cell is in relation with an undivided medullated nerve fibre. Beside the latter there are also other fibres which form a plexus and traverse the layer of granules in every direction, passing on one side into the white substance of the cerebellum, on the other into the molecular layer. These fibres are of very variable size, and anastomose freely

with each other. The first-mentioned fibres pass through the latter without entering into any union with them. In the interspaces of the fibres of this layer are hæmatoxylin cells—which correspond to what were hitherto termed granules (Körner), but which are connective-tissue elements,—and eosin cells, which are connected with nerve-fibres. The hæmatoxylin cells, which are glia cells with nuclei, protoplasm, and anastomosing prolongations, are found also between the nerve fibres of the white matter, and form a supporting medium like that in the white substance of the cord. The eosin cells seem to be only swellings of the axes-cylinders.

2. The molecular layer. The intercellular substance seems to be composed of a fine network. Between the layer of granules and molecular layer, B. describes a *limitans interna*, composed of glia cells which act as a support to the Purkinje's cells, and the nerve fibres and blood-vessels of the latter.

The following is Beevor's schema of the relations of the different parts. Each undividing nerve-fibre is in relation with one Purkinje's cell, its axis passing over into the protoplasm, its medullary sheath into the capsule of the cell. The axis-cylinder divides within the cell into a number of fibrillæ, which again pass into the dividing prolongations of the cells. The fibrillæ run in distinct threads to the periphery. Through the division of the prolongations the fibrillæ at last become isolated. They then bend at an angle of 90° to spread over the surface, and to be again collected into fibres surrounded by medullary sheaths, which, after entering into various plexuses, run into the white matter of the cerebellum.

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b—PHYSIOLOGY OF THE NERVOUS SYSTEM.

THE INFLUENCE OF SECTIONS OF THE SPINAL CORD UPON THE COMPOSITION OF THE BLOOD.—Quinquad has made several experiments upon this subject, and found a diminution of the carbonic acid the nearer the section was toward the cervical region. After a section of the cervico-dorsal segment of the cord he found, at the end of ten to fifteen minutes, that the blood in the femoral veins became arterial, and presented a deep red appearance; the oxygen was increased. Brown-Séquard, in his remarks upon this communication, stated that section of the cord produced two effects at one time: arrest of the changes in all the tissues, which explains the redness of the venous blood; and at another time exaggeration of these changes, or black blood in the arteries.—*Le Progrès Médicale*, No. 22, 1884.

CEREBRAL CONVOLUTIONS.—Brown-Séquard stated that since 1870–71 the idea had been advanced that the cerebral convolutions could be divided in two zones: the one, upon being excited,